CLAIMS

1. A security element comprising a magnetic layer and an embossed layer, the embossed layer having the form of a diffraction grating device, characterised in that the magnetic layer is a soft-magnetic layer and the soft magnetic layer having, at least partially, the shape of the embossed pattern of the embossed layer whereby the embossed layer affects the magnetic properties of the soft-magnetic layer and the effects are detectable externally of the security element.

2. A security element according to claim 1, characterized in that the security element further comprises at least a metal layer with a high specular reflectance.

3. A security element according to claim 2, characterized in that the metal layer with a high specular reflectance is chosen from aluminum, silver, chromium, gold or any other highly reflective metal layer or metal oxide such as titanium dioxide, niobium dioxide, tin oxide, indium oxide, indium - tin oxide or zinc oxide.

4. A security element according to claim 2 or 3, characterized in that the metal layer with a high specular reflectance is aluminum.

5. A security element according to anyone of claims 1 to 4, characterized in that the security element further comprises an adhesive layer.

6. A security element according to claim 5, characterized in that the adhesive layer consists essentially of an a,b-ethylenically unsaturated carboxylic acid-based resin.

7. A security element according to anyone of claims 1 to 6, characterized in that the embossed layer comprises an a,b-ethylenically unsaturated carboxylic acid-based resin.

8. A security element according to anyone of claims 1 to 7, characterized in that the diffraction grating device is embossed as to

form a hologram.

9. A security element according to anyone of claims 1 to 8, characterized in that the soft magnetic layer consists essentially of an alloy containing cobalt and niobium, together with a glass-forming element.

10. A security element according to anyone of claims 1 to 8, characterized in that the soft magnetic layer consists essentially of an alloy containing cobalt, iron, silicon and boron.

11. A security element according to claim 10, characterized in that said alloy contains further nickel.

12. A security element according to claim 10, characterized in that said alloy has the formula
$Co_a Fe_b Ni_c Mo_d Si_e B_f$, where a is in the range of 35 to 70 atomic percent, b is zero to 8 atomic percent, c is zero to 40 atomic percent, d is zero to 4 atomic percent, e is zero to 30 atomic percent and f is zero to 30 atomic percent, with at least one of the group b, c, d and e, f being non-zero.

13. A security element according to claim 12, characterized in that said alloy has a composition (in atomic percent) in the range :
Co 35-70, Fe 2-7, Ni 10-35, Mo 0-2, Si 12-20 and B 6-12.

14. A security element according to any previous claim, characterized in that the shape of the embossed pattern of the embossed layer is only embossed on a single soft-magnetic layer.

15. A security element according to any previous claim, characterized in that the material of the soft magnetic layer has a coercive force in the range 3 A/m to 500 A/m.

16. A security element according to any previous claim characterized in that the soft-magnetic layer is a non-work-hardened layer.

17. A security element according to any previous claim, characterized in

the soft-magnetic layer is a sputtered layer.

18. A security element according to any previous claim, characterized in that, the affect on the magnetic properties of the soft-magnetic layer is at least a change in coercive force of 10% or a change in relative permeability of at least 10%.

19. A method for producing a security element according to anyone of claim 1 to 18, comprising the steps of :
a) applying a release coating on a polymeric film carrier
b) applying an embossable layer on the polymeric film which is used as carrier, and
c) embossing the embossable layer with an diffraction grating pattern such as a hologram, characterised by:
d) applying a soft-magnetic layer on the embossed face of the embossed layer, whereby the application step affects the magnetic properties of the soft-magnetic layer and the effects are dectable externally of the security element.

20. A method for producing a security element according to claim 19, comprising further the step of applying a metal layer with a high specular reflectance under, above or on both sides of the soft-magnetic layer.

21. A method for producing a security element according to claim 19 or 20, comprising further the step of applying an adhesive layer on the top of the different deposited layers.

22. A method for producing a security element according to any of the claims 19 to 21, characterized in that the shape of the embossed pattern of the embossed layer is only embossed on a single soft-magnetic layer.

23. A method for producing a security element according to any of claims 19 or 22, characterized in that the material of the soft magnetic layer has a coercive force in the range 3 A/m to 500 A/m.

24. A method for producing a security element according to any of the

claims 19 to 23 characterized in that the soft-magnetic layer is a non-work hardened layer.

25. A method for producing a security element according to any of the claims 19 to 24, characterized in the soft-magnetic layer is a sputtered layer.

26. A method for producing a security element according to any of the claims 19 to 25, characterized in that, the affect on the magnetic properties of the soft-magnetic layer by the application step is at least a change in coercive force of 10% or a change in relative permeability of at least 10%.

27. A security document having a security element according to anyone of claims 1 to 18.

28. A security document according to claim 28, characterized in that such security document is a bank note, a credit card or a cheque.

29. A security document according to claim 28, characterized in that such security document is a label.

30. A method for the manufacture of a security document having a security element comprising the step of affixing a security element according to anyone of claims 1 to 18 to a substrate.

31. A method according to claim 30 characterized in that the security element is affixed to the substrate on an essentially clear region thereof.

32. A method including the step of detecting a change in the magnetic properties of the soft magnetic layer caused by the embossed layer in a security element in accordance with any of claims 1 to 18.